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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

GENCO, BRIAN C

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2615

DATE MAILED: 08/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,994

Applicant(s)

HORI ET AL.

Examiner

Brian C Genco

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings are objected to because in figure 3.3 the examiner notes the use of the terms "Shit Pixels," the examiner suggests the applicant to use the terms "Shift Pixels" instead. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-7 are rejected under 35 U.S.C. 102(a) as being anticipated by (USPN 6,046,772 to Howell et al).

In regards to claim 1 Howell et al, herein Howell, discloses all of the necessary information in order to reject all parts of the claimed "image processing apparatus" as noted in the following five paragraphs.

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In regards to the claimed "imaging optical system for forming an image of an object on an imaging surface" as claimed in claim 1 Howell discloses a digital camera that has "at the focal plane an array of electronic light-sensitive elements ... that produce a light-intensity-dependant electrical signal in response to being illuminated (column 1, lines 29-33, Howell)."

In regards to the claimed "color imaging device" as claimed in claim 1 Howell discloses an "array of electronic light-sensitive elements (column 1, line 30, Howell)." Howell further discloses "the color matrix in the present invention is based on a unit cell of primary colors that is a mosaic in which half the pixels are one primary color and the rest are divided equally between the two complementary primary colors (column 7, lines 14-18, Howell)." Note figure 3 depicting a "multiplicity of sets of four filters for three colors, two of said four filters being used for selected one of said three colors." Howell still further discloses "the unaided light-sensing elements do not distinguish between different colors of light ... In order to capture the color data needed ... one can use several primary color filters (column 2, lines 28-32, Howell)," or in other words the "object image being formed on said photo detectors through each of said filters by said imaging optical system."

In regards to the claimed "shift drive means for shifting said imaging optical system and said photo detectors relatively to each other by a length corresponding to a predetermined number of pixels in said imaging surface" as claimed in claim 1 Howell discloses "there are means provided in many digital cameras currently in use by which the light-sensitive array can be shifted by a single pixel ... the present invention utilizes a precision rotation of the digital camera about an axis passing through the principal point of its lens (column 9, lines 28-35, Howell)," whereby the "predetermined number of pixels" is "a single pixel (column 9, line 30, Howell)."

In regards to the claimed "image processing unit for generating an image using a plurality of image data picked up before and after said shift" as claimed in claim 1 Howell discloses "two photographs will serve to record the image in one primary color for every pixel position (column 7, lines 25-26, Howell)." Howell further discloses "between the two photographs the light sensing array is shifted with respect to the image by one pixel (column 7, lines 27-29, Howell)." Howell still further discloses "electronic circuitry/software used to combine the two images produced in the two-shot mode uses the luminous intensity of a particular primary color at all locations in the

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image to produce an integrated/interpolated image (column 7, lines 31-35, Howell)."

In regards to the claimed "image processing unit generates and outputs a single monochromatic image using only the pixel data detected by the photo detectors having said two filters of a single color" as claimed in claim 1 Howell discloses "as one records," or "outputs," " a series of photographs; each image," or "single ... image," captured will depict the scene as it appears in one primary color (column 2, line 35, Howell)," or "monochromatic," wherein one of the "series of photographs (column 2, line 33, Howell)" is of the color green as disclosed in figure 6. Howell further discloses from figure 6 that "the result of having taken the two single shots will be to obtain actual measurement data for green for every single point (column 9, lines 8-10, Howell)," or a "single monochromatic image" in green wherein the green color filter in figure 6 is the same as the claimed "said two filters of a single color."

In regards to claim 2 Howell discloses in figure 6 that his color filter is "arranged according to the Bayer scheme."

In regards to claim 3 Howell discloses the "light-sensing array is shifted with respect to the image by one pixel (column 7, lines 28-29)," wherein $n = 1$ is the integer of the claimed "length corresponding to $1/n$ " by which the "said shift drive

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means shifts said imaging optical system and said photo detectors relatively to each other."

In regards to claim 4 Howell discloses in figure 6 "said single color used by said two filters is green," also note figure 5(a)-(d).

In regards to claim 5 Howell discloses "as shown in the composite array at the bottom of FIG. 6, for the single color--- red or blue---," or "the pixels lacking the pixel data of said single color," "that needs to be interpolated at a given pixel ... For example ... actual measurements for the luminous intensity of green and blue, and requires an interpolation to be done to determine the contribution that red will make to the composite image (column 9, lines 11-19, Howell)."

In regards to claim 6 as being a method for using the device claimed in claim 1 see examiners notes on the rejection of claim 1.

In regards to claim 7 Howell discloses a "shifting step" as described in the rejection of claim 1 wherein in order to take a picture on Howell's camera on the "two-shot operation (column 6, line 52, Howell)" the camera takes a picture, which entails extracting data from the photo detectors, namely the green color filter's photo detectors, shifts the light-sensitive array, takes a picture, shifts the light-sensitive array back to its

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starting position or in other words "said shifting step, said image pickup step and said extraction step are executed repeatedly a plurality of times for different shift positions."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(USPN 4,652,928 to Endo et al)

(USPN 5,960,128 to Hamada)

(USPN 6,195,125 to Udagawa et al)

(USPN 6,418,245 to Udagawa)

(USPN 5,712,700 to Nagaishi et al)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached via the supervisor whose telephone number, which is 703-308-9644. The examiner can normally be reached on Monday thru Friday 8:00am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center 2600 customer service office whose telephone number is 703-306-0377.

Brian C Genco
Examiner
Art Unit 2615

July 24, 2002



ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600